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**Ex Parte**

Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: *Wireless E911 Location Accuracy Requirements*, WT Docket No. 07-114
Status Reports – Update on Device-Based Location Solution Implementation Plans

Dear Ms. Dortch:

Later this summer, Verizon will submit its three-year progress report on its implementation plan for meeting the Commission's indoor location accuracy requirements. Verizon has exceeded the Commission's compliance milestones for 50 meter accuracy thus far, and remains active in the development and implementation of the National Emergency Address Database ("NEAD") scheduled for launch later this year. Verizon's plan also has several other methods for improving the accuracy of the x, y coordinate information delivered to PSAPs, including so-called "device-based hybrid" or "DBH" solutions in which the wireless handset uses both satellite information and Wi-Fi based information to generate a highly accurate x, y coordinate. Given stakeholders' recent focus on DBH solutions in recent weeks, Verizon is providing an update of its implementation plan for DBH and other device-based location solutions, together with an explanation of the critical technical and policy factors underlying it.

## I. Verizon's Implementation Plans for Device-Based Location Information

While Verizon's upcoming status report will detail its overall progress, the promise of DBH in particular has received heightened stakeholder attention. There are two principal methods of using device-level location information for E911: "Mobile Station Based" ("MSB") location, which, like many commercial LBS applications, relies solely on the location calculation derived by the handset's internal operating system, without action by the service provider; and "Mobile Station Assisted" ("MSA"), which integrates the handset-level GPS and Wi-Fi capabilities with the wireless provider's existing Assisted-GPS ("A-GPS") functionality and uses the mobile network to calculate the location fix. (The NEAD will supplement these methods once available.) Consistent with Commission guidance, Verizon's plan is, whenever possible, to deliver *both* MSA and MSB information to its location server which, in turn, will choose the better of the horizontal location estimates to send to the PSAP, whether MSB, MSA,

dispatchable location or other.[1] Verizon has worked diligently over the past several months with solution providers and will implement MSA and MSB across its handset portfolio as follows:

- *iOS*. Verizon-branded devices launched in 2017 or earlier (iPhone5-iPhoneX) use MSA. Apple Watches currently in market use MSB. MSB using Apple's HELO solution will be available for new iOS-enabled devices going forward. And Verizon hopes that future models will include both MSB *and* MSA, but that will depend in large part on handset and chipset manufacturers' willingness to implement both.

- *Android*. Verizon has contracted with a third party Wi-Fi access point aggregator to proactively develop its own Wi-Fi solution for devices that pass Wi-Fi access point information, such as Android devices. This MSA-based solution will use the Wi-Fi access point information and the location sources already in use today (e.g. GPS and OTDOA), and is targeted for introduction in Verizon's network for the fall of 2018. Verizon looks forward to working with vendors to incorporate reliable MSB-based methods into Android devices.

## II. Principles for E911 Location Accuracy Solutions

In its February 2017 implementation plan, Verizon explained that "[s]ervice providers and other players in the communications ecosystem should plan and design services and products that accommodate the use of both dispatchable location *and* x, y location methods, *and where possible should employ multiple reliable solutions to achieve both*."[2] To adhere to this policy and to meet important Commission and public safety objectives, Verizon applies the following principles to *all* E911 location solutions, not just DBH:

- *Accuracy Testing Using Permissible Technologies*. It goes without saying service providers cannot rely on any E911 solution for compliance purposes that has not undergone the rigors of the indoor location accuracy test bed and demonstrated consistency with existing outdoor location accuracy rules. And those solutions must, of course, comply with other applicable Commission rules and policies, for example: solutions that rely on their own licensed or unlicensed spectrum must comply with Commission technical and licensing rules; and legitimate consumer privacy interests must be accounted for.

- *Facilitating Future Compliance*. The use of a particular E911 solution should not be subject to terms and conditions or technical parameters that preclude a provider from implementing additional solutions to meet its horizontal location accuracy requirements or vertical location accuracy in the future, including the delivery of

[1] In adopting the rules, the Commission found that "CMRS providers have significant incentive in many indoor situations to pair A-GNSS with other location technologies," citing favorably to the CSRIC IV finding that "[m]ultiple combinations of different technologies can be combined together to produce a more reliable and accurate position estimate than any one system alone." *See Wireless E911 Location Accuracy Requirements*, Fourth Report and Order, 30 FCC Rcd 1259, ¶ 94 (2015) ("*Fourth Report and Order*").

[2] Verizon Implementation Plan, WT Docket No. 07-114, at 1-2 (Feb. 3, 2017) (emphasis added).

dispatchable location through the NEAD and other technologies. Locking service providers into a single location solution serves neither consumers nor PSAPs, slows adoption of innovative technologies, and undermines the multiple-solution approach the Commission requires.[3]

- *Reliability Assurances and Troubleshooting*. Service providers' traditional E-911 location solutions, such as A-GPS and OTDOA, rely at least in part on network-level capabilities into which the service provider has direct visibility or oversight. DBH and other Wi-Fi-based solutions, however, necessarily rely on third party proprietary databases. Service providers do not enjoy that same access to these Wi-Fi databases, even though they remain responsible for regulatory compliance and troubleshooting with PSAPs.[4] Thus, since wireless providers do not directly manage or oversee those solutions, they need assurances that the third party provider adequately cares for reliability and security. These issues are non-trivial; when 911 calls are involved, it is important that Wi-Fi access point information is accurate and the database remains secure and operational. Service providers should have access to handset information (e.g. Wi-Fi AP MAC addresses, beacon identifiers, satellite visibility, etc.) for validation purposes as part of their use in emergency call delivery and response.

- *PSAP Expectations*. Finally, given its troubleshooting role for PSAPs and to ensure that PSAPs can make informed choices about their E911 and NG911 investments, it is critical that service providers understand how the information is delivered from their networks and devices, and how it will appear to the PSAP's operators. A vendor's failure to account for this factor can delay its adoption by service providers.

Verizon applies these criteria flexibly so that innovative solutions are not unnecessarily precluded. These principles may be more acute for some solutions than others, and strengths in one factor can offset shortcomings in another. In addition, many of these due diligence efforts and discussions with vendors will necessarily occur out of public view given the commercial relationships involved. But all of them reflect common sense and are intended to help Verizon meet and exceed the Commission's important location accuracy standards.

We look forward to providing our full implementation status report in August. In the meantime please feel free to contact me if you have questions or need additional information.

Sincerely,

[3] *See Fourth Report and Order* ¶ 94.

[4] The rules place wireless providers squarely in the role of directly engaging with PSAPs to attempt "to troubleshoot and identify issues regarding [the] E911 location accuracy" of their E911 ALI solutions. *Id.* ¶ 148.